DEPARTMENT OF **EARTH AND ENVIRONMENTAL SCIENCES**
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The impact of the African Great Lakes on the regional climate

in a dynamically downscaled CORDEX simulation (COSMO-CLM)

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My website:

1. Motivation

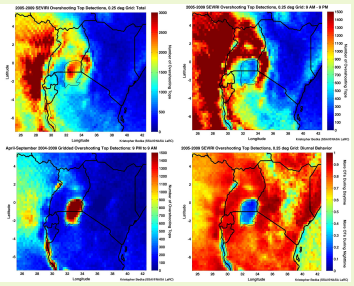

Figure 1. SEVIRI Overshooting top detections (Bedka, pers. comm.).

- severe night-time thunder-storms pose a serious tread to local fishing communities
- 5000 casualties per year estimated by local policy makers

Figure 2. Traditional fishing in Lake Kivu.

2. Setup

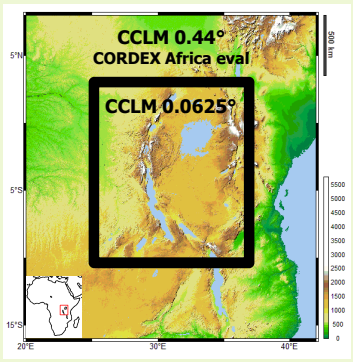

Figure 3. Nesting strategy.

- 2002
- three configurations:
  - CCLM SST ➔ CORDEX!
  - CCLM FLake
  - CCLM²
- nolakes: each lake pixel replaced by a random land pixel within 50 km radius

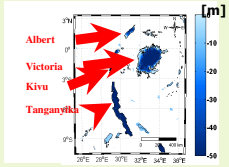

Figure 4. FLake bathymetry.

3. Model performance

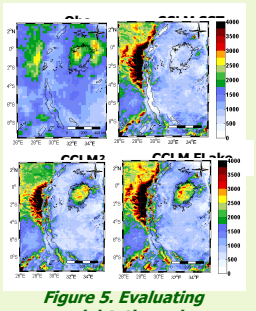

Figure 5. Evaluating precipi-tation using TRMM.

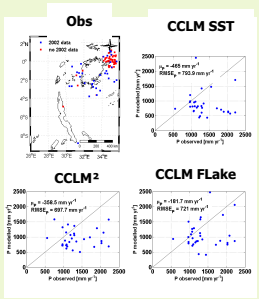

Figure 6. Evaluating precipi-tation using pluviometers.

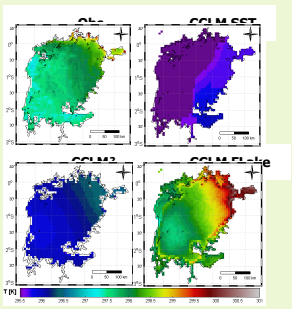

Figure 7. Evaluating lake surface temperatures using satellite data.

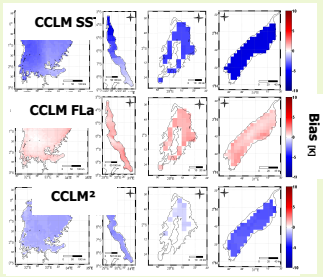

Figure 8. Lake surface temperature bias.

- In contrast to CCLM FLake and CCLM², CCLM SST does not capture the enhanced precipi-tation over the AGLs
- using FLake cuts the bias in half relative to the default configuration!
- while CCLM SST and CCLM² depict a cold bias, CCLM FLake closely reproduces the observation s
- this pattern is reproduced over the largest AGLs

4. Impact

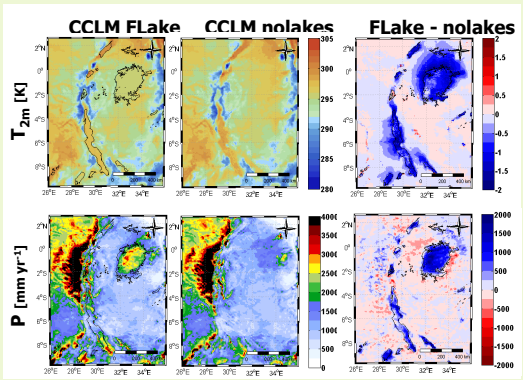

Figure 9. Impact of the AGLs on the regional climate.

- the AGLs cool the surface and generate enhanced precipitation, in both cases with pronounced spatial patterns.
- interesting exception is Lake Kivu, which calls for further investigations
- thermal inertia of the AGLs generates enhanced night-time moisture input into the boundary layer, near-surface convergence cause the lifting of these air masses

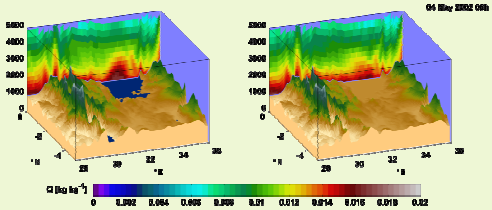

Figure 10. Total moisture content in the lower troposphere

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